

## A Closer Look at Quality Control

**S**pectrometers, which are durable, lightweight, and compact instruments, are a requirement for NASA deep space science missions, especially as NASA strives to conduct these missions with smaller spacecraft. NASA's Jet Propulsion Laboratory (JPL) awarded the Brimrose Corporation of America a **Small Business Innovation Research (SBIR)** contract to develop a compact, rugged, near-infrared spectrometer for possible future missions.

Spectrometers are of particular importance on NASA missions because they help scientists to identify the make-up of a planet's surface and analyze the molecules in the atmosphere. Minerals and molecules emit light of various colors. The light, identified as spectra, is difficult to see, and spectrometers, which are essentially special cameras that collect the separate colors of light in an object, allow scientists to identify the different materials. For example, spectrometers can help scientists determine whether soil was created from lava flows or from meteorites.

Brimrose's work for JPL led to a spectrometer that created a significant breakthrough in optical spectrometry. As a result, the Baltimore, Maryland-based company developed the commercially available Luminar 5030 Mini Spectrometer. This innovation is a hand-held analytical instrument utilizing Brimrose's high performance Acousto-Optic Tunable Filter-Near Infrared technology. The product delivers rapid, multi-component analysis for a wide variety of commercial applications,

making it a powerful new tool for quality control and process troubleshooting.

The Luminar 5030 can be applied to materials such as powders, polymer pellets, paper goods, fruits and grains, liquids, and vines. The tool performs measurements for moisture, active ingredients, coating weight, and blend assays, as well as for fat, sugar, and protein. The Luminar 5030 can be used for monitoring and control processes in the chemical and petrochemical industry, the inspection of tablets and powder mix control in the pharmaceutical industry, and composition monitoring in the food and beverage industry. For example, Brimrose markets the Luminar 5030 to wineries, enabling vintners to analyze grapes prior to producing wine. The tool's versatility extends from the laboratory to the production floor and field, providing nondestructive and contact/noncontact testing and inspection.

In the pharmaceutical industry, Brimrose's optical spectrometers have passed Good Manufacturing Practice requirements for hardware and software, granting them Food and Drug Administration certification for drug manufacturing by both AstraZeneca, of Wilmington, Delaware, and Pfizer, Inc., of New York, New York. AstraZeneca has chosen Brimrose systems as the only process control spectrometer to be used for manufacturing its pharmaceutical drugs.

Brimrose is continuing to partner with NASA through the SBIR program. The company is in the process of developing a space-qualified optical spectrometer intended for use onboard the land rover vehicles for investigating the surface and subsurface of Mars.



The Luminar 5030 Mini Spectrometer enables vintners to analyze grapes prior to producing wine.